

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte HIROSHI MURAMATSU, TATSUAKI ATAKA,  
MASAMICHI FUJIIHARA and NORIO CHIBA

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Appeal No. 1997-1430  
Application No. 08/225,756<sup>1</sup>

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HEARD: November 16, 1999

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Before FLEMING, RUGGIERO, and LALL, Administrative Patent Judges.

RUGGIERO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal from the final rejection of claims 14-34, all of the claims pending in the present application. Claims 1-13 have been canceled. Amendments

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<sup>1</sup> Application for patent filed April 11, 1994.

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after final rejection filed December 26, 1995 and April 26, 1996 have been entered by the Examiner. In response to the Appellants' Brief on Appeal, the Examiner indicated the allowability of claims 16-20, 23-27, and 30-34 in the Supplemental Examiner's Answer. Accordingly, this appeal now involves only claims 14, 15, 21, 22, 28 and 29.

The disclosed invention relates to a scanning near-field optic/atomic force microscope for performing optical and topography measurements of the surface of a sample. More particularly, Appellants indicate at pages 5-10 of the specification that the microscope includes a sharpened probe having a hook-shaped front end portion and a light reflecting portion for detecting deflections of the probe.

Claim 14 is illustrative of the invention and reads as follows:

14. A scanning near-field optic/atomic force microscope for observing topography and optical characteristics of a surface of a sample, the microscope comprising:

a sharpened probe having a hook-shaped front end portion provided with an optical hole for passing light at a sharpened end thereof and having light-reflecting means on a part thereof for reflecting light;

a light source and optics for irradiating the sample with light;

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a photoelectric converter and optics for receiving at least one of a light transmitted through the sample or a light reflected by the sample;

a laser source for producing laser light for detecting deflections of the sharpened probe;

a condenser lens for directing the laser light to the light-reflecting means on the sharpened probe;

detecting means for detecting light reflected from the light-reflecting means;

moving means for effecting relative movement between the sample and the sharpened probe; and

a control means for controlling a distance between the surface of the sample and a front end of the sharpened probe

The Examiner relies on the following prior art:

Barrett 1993	5,210,410	May 11, (Filed Sep. 26, 1991)
Betzig 1993	5,254,854	Oct. 19, (Filed Nov. 04, 1991)
Fujihira et al. (Fujihira) 1994	5,304,795	Apr. 19, (Filed Sep. 30, 1992)

Claims 14, 15, 21, 22, 28, and 29 stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Fujihira in view of Barrett and further in view of Betzig.

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Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Briefs<sup>2</sup> and Answers for the respective details thereof.

#### OPINION

We have carefully considered the subject matter on appeal, the rejection advanced by the Examiner and the evidence of obviousness relied upon by the Examiner as support for the rejection. We have, likewise, reviewed and taken into consideration, in reaching our decision, Appellants' arguments set forth in the Briefs along with the Examiner's rationale in support of the rejection and arguments in rebuttal set forth in the Examiner's Answers.

It is our view, after consideration of the record before us, that the evidence relied upon and the level of skill in the particular art would have suggested to one of ordinary skill in the art the obviousness of the invention as set forth in independent claims 14, 21, and 28. We reach the opposite

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<sup>2</sup> The Appeal Brief was filed April 26, 1996. In response to the Examiner's Answer dated July 23, 1996, a Reply Brief was filed September 27, 1996. The Examiner entered the Reply Brief and submitted a supplemental Examiner's Answer on October 29, 1996.

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conclusion with respect to dependent claims 15, 22, and 29.  
Accordingly, we affirm-in-part.

As a general proposition in an appeal involving a rejection under 35 U.S.C. § 103, an Examiner is under a burden to make out a prima facie case of obviousness. If that burden is met, the burden of going forward then shifts to Appellants to overcome the prima facie case with argument and/or evidence. Obviousness is then determined on the basis of the evidence as a whole and the relative persuasiveness of the arguments. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); In re Hedges, 783 F.2d 1038, 1039, 228 USPQ 685, 686 (Fed. Cir. 1986); In re Piasecki, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984); and In re Rinehart, 531 F.2d 1048, 1052, 189 USPQ 143, 147 (CCPA 1976). Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make in the Briefs have not been considered [see 37 CFR § 1.192(a)].

The Examiner has grouped all of the appealed claims together in the 35 U.S.C. § 103 rejection and proposes to modify the microscope structure of Fujihira by relying on

Betzig to supply the missing teaching of utilizing a hook-shaped probe configuration for passing light to or from a measured sample. In support of the 35 U.S.C. § 103 rejection, the Examiner offers two separate rationales in support of the conclusion of obviousness. Initially, the Examiner asserts (Answer, page 5, section C) the art recognized functional equivalence of Betzig's hook-shaped probe and the probe illustrated in Figure 5 of Fujihira. Secondly, the Examiner (Answer, page 5, section B) cites a passage from column 7 of Betzig which sets forth the advantages of a hook-shaped probe (i.e. the probe tip is exposed to the sample regardless of the orientation of the probe supporting structure) as a motivating factor for substitution of Betzig's hook-shaped probe for the Figure 5 probe of Fujihira. Barrett is additionally added to the combination as providing a teaching of vertically vibrating an optical probe relative to a sample to be measured.<sup>3</sup> In the Examiner's view, the skilled artisan would

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<sup>3</sup> As correctly pointed out by Appellants (Brief, page 10), Barrett has been applied solely to address the vertical vibration feature, a feature which appears only in dependent claims 15, 22, and 29.

recognize the well known advantages of vibrating a probe or sample to assist in analysis of the sample.

In response, Appellants' arguments are primarily directed to the contention that the Examiner has failed to establish a prima facie case of obviousness since no support for the Examiner's assertion of functional equivalence has been provided. Appellants further argue (Reply Brief, page 10) that, even assuming the functional equivalence of the probe tips of Fujihira and Betzig, the mere existence of functional equivalence does not establish obviousness.

After careful review of the prior art in light of the arguments of record, we agree with Appellants that the Examiner has not established support for a conclusion of art recognized functional equivalence. The mere fact that two elements are used for the same purpose or, in the Examiner's words (Answer, page 5) "... both desire the same thing...", does not establish art recognized functional equivalence. In order to rely on equivalence as a rationale for supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional

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or mechanical equivalents. In re Ruff, 256 F. 2d 590, 118 USPQ 340 (CCPA 1958).

With respect to the Examiner's second obviousness rationale, however, we are of the view that the Examiner's analysis has at least satisfied the burden of presenting a prima facie case of obviousness. In other words, the Examiner has pointed out the prior art teachings of Fujihira and Betzig, has reasonably indicated the perceived differences between the prior art and the claimed invention set forth in independent claims 14, 21, and 28, and has provided reasons (Answer, page 5, section B) as to how and why the Fujihira's microscope would be modified by the substitution of the hook-shaped probe of Betzig to arrive at the claimed invention.

After reviewing Appellants' arguments in response, it is our opinion that, to the extent any arguments have been directed to the issue of the combinability of Fujihira and Betzig, we find such arguments to be unpersuasive in overcoming the Examiner's prima facie case of obviousness. Appellants' arguments in the Briefs regarding the merits of the teachings of Betzig center on the contention that Betzig's probe is a shear-force detecting probe rather than a light



probe. We find this contention to be without merit. Betzig has a clear teaching of using the disclosed probe as a NSOM (near-field scanning optical microscopy) probe as well as a shear-force probe (Betzig, column 4, lines 41-45; column 6, lines 8-10). Further, Betzig discloses the formation of an optical aperture in the probe tip (columns 6, lines 24-37) as well as various illumination geometries for NSOM imaging as discussed at column 7, lines 28-45 of Betzig, all of which encompass the functioning of Betzig's probe tip as a light probe. In our view, the combination resulting from the Examiner's proposed substitution of Betzig's hook-shaped probe for that of Fujihira would meet all of the claimed requirements. Since the Examiner's prima facie case of the obviousness of this proposed combination remains unrebutted by any convincing arguments by Appellants, the Examiner's 35 U.S.C. § 103 rejection of independent claims 14, 21, and 28 is sustained.<sup>4</sup>

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<sup>4</sup> The Barrett reference relied on by the Examiner solely to address the vertical vibrating feature limitations of dependent claims 15, 22, and 29 is cumulative to that of Fujihira and Betzig with respect to independent claims 14, 21, and 28 which contain no such limitations. In affirming a multiple reference rejection under 35 U.S.C. § 103, the Board

With respect to dependent claims 15, 22, and 29, our earlier discussion indicated that the sole ostensible reason for the Examiner's inclusion of Barrett in the proposed combination of references was to address the feature of vertical vibration of the probe relative to the sample. Upon careful review of Barrett, as well as the other applied references to Fujihira and Betzig, we agree with Appellants that no disclosure of any such vibrating feature exists in this prior art. In our view, the control of probe scanning along a Z-axis such as in Barrett and Fujihira does not equate to a vertical vibrating movement as claimed. Further, the Examiner's contention (Answer, page 6) that the feature of vibrating a probe relative to a sample is well known in the art and, therefore, would lead the skilled artisan to utilize such feature in sample analysis is totally without support on the record. We are not inclined to dispense with proof by evidence when the proposition at issue is not supported by a

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may rely on less than the total number of applied references in an obviousness rationale without designating it as a new ground of rejection. In re Bush, 296 F.2d 491, 496, 131 USPQ 263, 266-67 (CCPA 1961); In re Boyer, 363 F.2d 455, 458, n.2, 150 USPQ 441, 444, n.2 (CCPA 1966).

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teaching in a prior art reference, common knowledge or capable of unquestionable demonstration. Our reviewing court requires this evidence in order to establish a prima facie case. In re Knapp-Monarch Co., 296 F.2d 230, 232, 132 USPQ 6, 8 (CCPA 1961); In re Cofer, 354 F.2d 664, 668, 148 USPQ 268, 271-72 (CCPA 1966). Accordingly, since all of the limitations are not taught or suggested by the prior art, we do not sustain the obviousness rejection of dependent claims 15, 22, and 29.

In summary, we have sustained the 35 U.S.C. § 103 rejection of independent claims 14, 21, and 28, but have not sustained the 35 U.S.C. § 103 rejection of dependent claims 15, 22, and 29. Therefore, the Examiner's decision rejecting claims 14, 15, 21, 22, 28, and 29 is affirmed-in-part.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR

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§ 1.136(a).

AFFIRMED-IN-PART

MICHAEL R. FLEMING	)	
Administrative Patent Judge	)	
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	)	
	)	BOARD OF PATENT
JOSEPH F. RUGGIERO	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
	)	
	)	
	)	
PARSHOTAM S. LALL	)	
Administrative Patent Judge	)	

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DECISION: AFFIRMED-IN-PART

Send Reference(s): Yes No  
or Translation (s)

Panel Change: Yes No

Index Sheet-2901 Rejection(s):

Prepared: June 21, 2001

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Final

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